



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

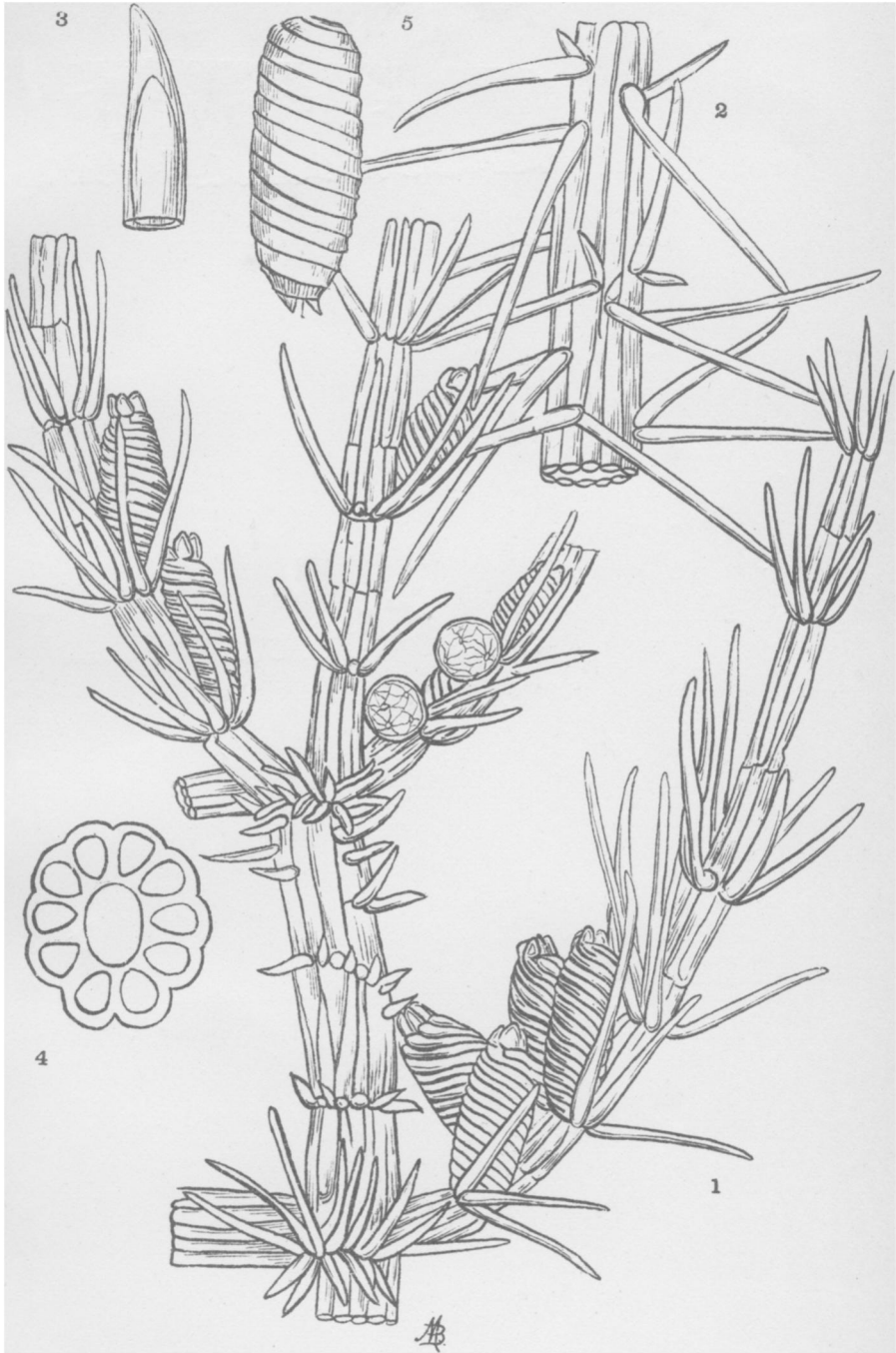
Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

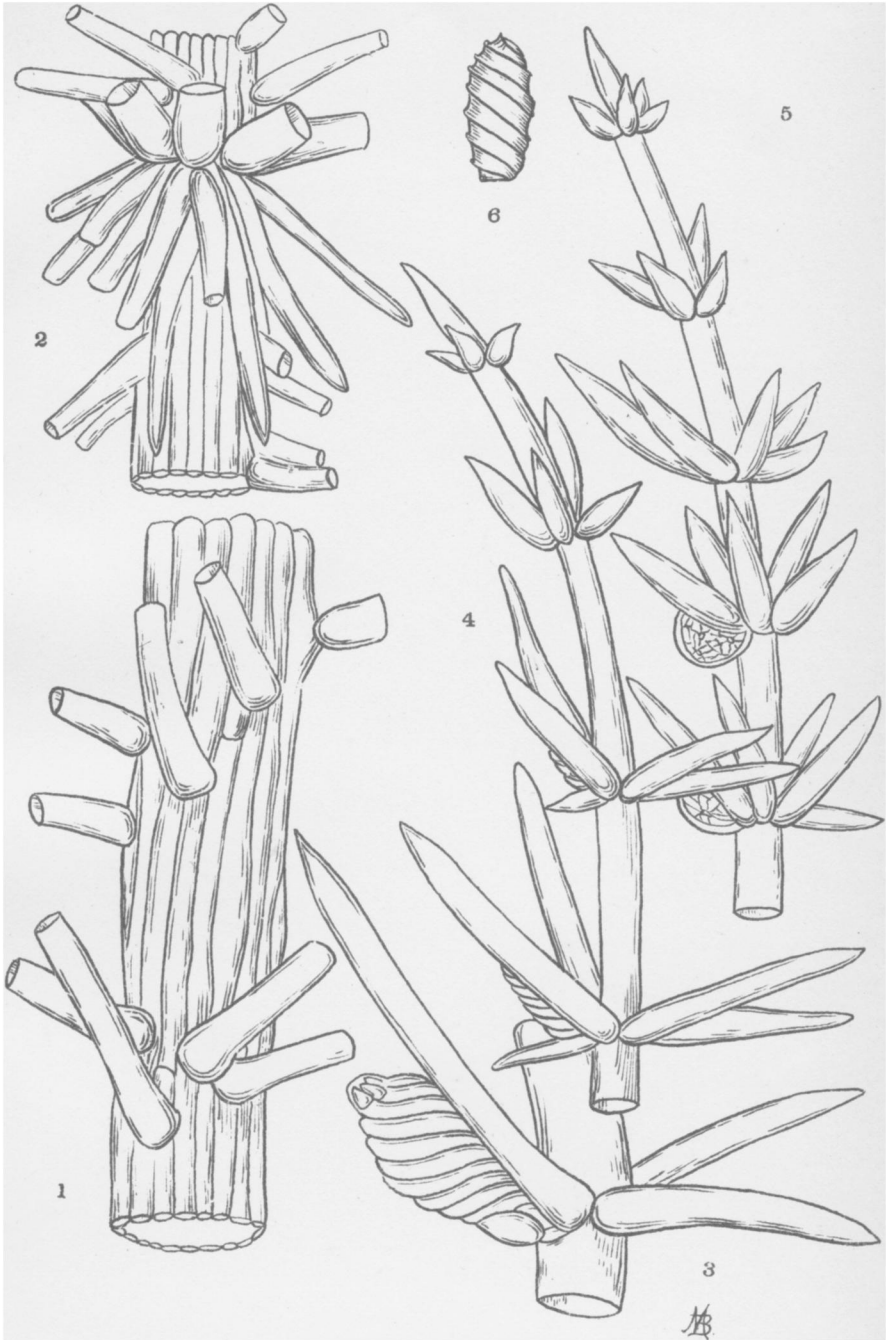
Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.













BULLETIN
OF THE
TORREY BOTANICAL CLUB

JUNE 1900

Three new Charas from California

BY T. F. ALLEN

(WITH PLATES 10-15)

CHARA HORNEMANNI **Nordhoffiae**

Euchara: haplostephana bistipulata diplosticha dioica major.

Plant large, branched, growing to greatest perfection in deeper water, 25-30 cm. long: in shallower water becoming stouter but shorter and more condensed. Stem usually elongated, 2-3 mm. in diameter, covered with acutely pointed spines, whose length is 2-3 times the diameter of the stem; diameter of the spines $160\ \mu$: cortex of the stem "diplosticha," the cortex tubes uneven, the primary series more prominent, but not larger; the tubes of the secondary series unite obliquely. (In the type species *Chara Hornemanni* Wallm., the cortex tubes are much more regular and uniform in size.) Spines scattered, isolated, cylindrical in form, in length more than double the diameter of the stem, about $160\ \mu$ in diameter; in younger internodes, these spines are much shorter, often even triangular in shape: verticils somewhat remote, the internodes about equal the length of the leaves; the verticils consist of about 9 leaves: leaves spreading or partly reflexed, 6-8 cm. long, $325\ \mu$ in diameter at lowest segment, consisting of 4 or 5 nodes: stipules subtending the verticils, arranged in a single series of cells, double the number of the leaves; stipule cells well developed, attaining a length of 15-20 mm., very similar in form and size to the spines, though a trifle stouter ($25\ \mu$ in diameter).

The stiffly spreading stipules in the growing plant give a peculiar appearance, which prominently distinguishes the plant from all other adjoining vegetation, by the stiff "beard" about the stem, beneath the verticils of leaves.

The leaves are not corticated, but their nodes are provided with whorls of bracts, similar in shape to the spines and stipules. The leaf terminates in a single cell which much exceeds the length of the bracts of the ultimate node. The male and female fruit are born *on separate plants*; the male plants are usually larger, especially more elongated and diffusely branched; the female shorter and usually found in quite shallow water. The foliae, bearing antheridia, have nodes bearing 6 verticillate bracts without an antheridium: but on a node bearing an antheridium will be found 5 nodal cells bearing bracts; while the antheridium clearly occupies a nodal cell, replacing a bract. In the spore-bearing leaves, however, one finds a normal number of bracts and also a sub-sporal bract, developed (often imperfectly) from a cell, which would in a normally developed, monoecious chara bear an antheridium. This pre-bracteole or sub-sporal bract is frequently developed no farther than a swollen cell or a minutely protruding elongation, but all degrees of development may be noticed, as shown in the engraving; even to a pre-bracteole quite as long as the entire sporophyidium. The antheridium is 710 to 720 μ in diameter. The oöspore is black, about 700 μ long (650–780) and 400 μ broad *with 7 prominent but not acute ridges*. The coronula of the sporophyidium is rounded in outline and consists of 5 connivent cells.

The type of the species, *Chara Hornemanni* Wallm., is also tropical or sub-tropical in habitat; it was first collected near Caraças, South America, and is known from the West Indian islands, Florida (Key West), Texas (collected by Wright), Lower California (San Ramon), collected by Mrs. Brandegee, etc. It is distinguished by its broader and more inflated bracts, stipules and spines; its *cortex-tubes* are much more regular and evenly developed but well rounded out, Diplosticha; the spines of the stem are rather inflated than cylindrical, 4–5 mm. long, 400–500 μ in diameter, abruptly pointed, often paired, one longer by one shorter. The stipules and bracts similar in appearance to the spines. In this species the development of a *pre-bracteole cell* is also noted. The oöspore is reported by Braun as *dark-brown* with 10 striae, coronula blunt with connivent cells. A Mexican form is also noted with 8 leaves, 12 stipules and 4 nodes. Antheridium 1000–1200 μ in diameter; oöspore 800 μ long, 450–480 μ broad.

Miss Nordhoff's *Chara* was collected in the small lake at Lakeside in San Diego Co., Calif., where it grows luxuriantly, quite monopolizing one end of the lake, the other end equally occupied by *Chara hirsuta* Allen. The numerous "sinks" in the surrounding country, kept supplied during the long "dry season" by subterranean waters, are also well stocked with this species. The species has a fresh, light green color and is very noticeable by the peculiar beard of stipules which surrounds the stem at intervals. Fertile spore-bearing plants were found only in very shallow water; the large and diffuse plants growing in deep water were all of the male form. Collected by Miss Nordhoff in August, 1898.

The appearance of this variety differs strikingly from *Chara Hornemanni* A. Br.; the latter is stouter with more nodes on the leaves: the spines of the stem numerous and very broad, diameter 400–500 μ (*Nordhoffiae* 160 μ in diam.); the difference in size of stipules and bracts equally great.

Chara hirsuta

Euchara: corticata diplostephana haplosticha-vera monoica contigua.

Plants slender, elongated, sparingly branched, the branches rivalling the main stem in length and appearance, 5–6 cm. in length (varying with the depth of the water); rarely of greater length, for the plant does not frequent a great depth of water and seems to extend to the surface. A single stem from the root sends out 5 or 6 long shoots, though when growing in shallow water a stem may have quite a "tuft" of shoots near the apex. The stem is extremely hairy; seeming larger than it really is, owing to the long and dense hairs which cover it. The stem is from 450 to 500 μ in diameter; the spines (hairs) arising from it, slender and more than twice as long as the diameter of the stem; 1000–1400 μ long \times 75–80 in diameter. The stem is, when mature, singly and quite regularly corticated, though, in the younger portions, the cortex cells do not always quite unite, leaving spaces, which may or may not become occupied by imperfectly developed secondary cortex tubes; this imperfect development of the cortex is frequently noticed in the leaves which are at times quite imperfectly corticated. The spines are quite numerous and very slender, usually developed in pairs from the nodal cortex-cells. These paired cortex-spines are very unequal; often the second cell is developed only as a mere "knob" and not produced as a spine;

but even when developed it is very slender and rarely reaches half the length of its better developed fellow. In the upper, younger portion of the stem the cortex tubes are sometimes quite imperfectly developed and very decided spaces may result, which are not filled by a secondary cortex-system; nor does any secondary cortex system attempt to develop; but elongated open spaces are left between the primary cortex-cells which are not contiguous; the spines are also imperfectly developed and simulate the stipular cells. The *stipules* are *double*; the upper cell much longer than the lower, often exceeding the first (lowest) segment of the leaf. The stipules are in appearance quite similar to the spines of the stems and the bracts of the foliae. The leaves (foliae) arise from the nodes of the stem in whorls of about 10, subtended by stipules which are double; one cell extending upward, usually longer than the basal node of the leaf; the lower stipular cell rather less than half the length of the upper; extending downward but not appressed against the stem. A leaf generally bears 5 or 6 nodes, of which 2 or 3 are fertile. The leaves are short and connivent, not at all spreading; they bear fruit abundantly. In some very hairy specimens the whorls of leaves seem scarcely longer than the hairs of the stem. In the older stems the verticils become remote; the internodes often 15–20 mm.; in younger internodes the whorls of short leaves almost touch, and the plant appears moniliform. The bracts at the nodes of the leaf are verticillate, the posterior being very little shorter than the anterior; usually 8 bracts develop at each node; the anterior decidedly longer than the oösporangium. All bracts are linear in shape, resembling the spines of the stem. The leaves are singly corticated and terminate in a "tuft" of nodal bracts generally 4 in number. The plant is monoecious, fruiting very freely. The antheridia mature while the oöspores are still very young, and so far noticed only on quite immature leaves: they are about 30 μ in diameter. The oögonia are very frequently paired on the first and second nodes of the leaf, subtended by linear bracts which are much longer than the entire oögonium and coronula.

The coronula is composed of closely-connivent, square-shaped cells; the whole coronula about 24 μ high by 36 μ broad. The entire oögonium (without the coronula) averaging 2 mm. in height by 0.8 mm. broad; the *oöspore* is black, long and narrow, 650 μ long, 260 μ broad, with 14 or 15 striae, ridges *not prominent*.

The nearest allies, systematically, are doubtless *C. crinita* Wallr., *C. altaica* A. Br. and *C. evoluta* Allen; the former Asiatic, the latter American (northwestern); like these, this plant is singly corticated (stem and leaves), with a tendency to irregularity in the

cortex, though no tendency to the formation of a secondary cortex is seen in this species. This plant bears abundant oöspores like the didecious species *C. crinita* A. Br.; and the development of spines and bracts is similar to *C. crinita*; also in size it approaches that species though it is much larger than *C. crinita*, which grows in salt or brackish water in the eastern part of the country while *C. hirsuta* A. grows in fresh water in California. There seems no doubt as to its distinctness, though when gathered it seemed possibly a monstrous form of *C. evoluta* Allen, which has been found in several places in northern California and British America, extending eastward into Montana and Dakota; but this species is only an inch or two high and in the northwest Provinces, especially in the Saskatchewan preferring the brackish water pools, which abound there. *C. hirsuta* abounds in one extremity of the pond at Lakeside, San Diego Co., Calif., the other end of which is entirely monopolized by *C. Nordhoffiae* Allen. This species was not noticed in other small pools in the neighborhood nor indeed elsewhere in California. Lakeside is about twenty-five miles inland from the coast; its small lake is a favorite resort in the fall of ducks which seem to be attracted by the immense masses of a profusely fruiting *Potamogeton* (*pectinatus*) which, after a few days, disappears entirely, devoured by the wild ducks, who in turn vanish under the continuous fire of the hunters who flock in swarms after the canvas-backs.

CHARA GYMNOPUS *Sanctae-Margaritae*

The number of sub-species of this widely-different and variable species extending from Africa to the warmer portions of America is already large, but the form now noted cannot be assigned to any hitherto known, and must be described as new.

These plants grow in dense masses or "tufts" 75–100 cm. long, are bright green and moderately incrustated; .75–1 mm. in diameter; *spines* very numerous near the terminal portions of the stem, more scattered or absent entirely on the older stems; rather slender; in length, less than half the diameter of the stem, about 450–700 μ long by 70 μ in diameter.

Verticils of leaves becoming crowded near the apex of the stems, where they overlap, forming dense masses of crowded leaves, consist of 12 leaves: *stipules*, of the upper series, about 700 μ

long, of the lower, 400 μ long about 125 μ broad at the base, tapering to a sharp point; upper series much exceeding the length of lowest leaf-node.

Leaves consist of 8 to 10 nodes, of which the ultimate segment is naked, also *lowest* internode (gymnopus); the 3 or 4 lowest nodes are fertile, *the lowest node always so*. *The bracts of the leaf-nodes are verticillate*, or the posterior bracts only slightly shorter than the anterior; the latter are often as much as 1200 μ long by 70 μ broad; the posterior bracts 400–500 μ long by 68–70 μ broad; the anterior bracts are generally twice as long as the oösporangium. The lowest node is always fertile; the lowest segment of the leaf is not contracted, about 450 μ in diameter, by about 600 μ in length; the antheridia about 350 μ in diameter, the nucleus oösporangium 680 μ long by 290 μ broad, with 14 ridges.

The nearest allied species is *C. gymnopus* A. Br., var. *elegans* A. Br., from which it is distinguished by the size of the spines (in *elegans*, 100 μ in diameter by 1350 μ long, also thickly covering the upper portion of the stems), the stipules and bracts also are much longer; in *elegans* the stipules 1300 μ long by 50 μ diameter. The relative breadth of the *spines*, *stipules* and *bracts* is greater in var. *sanctae-margaritae* than in *elegans*. At Fig. 5 a comparison is made between the lowest (naked) leaf-node of var. *elegans* and *sanctae-Margaritae*, Fig. 2.

Explanation of Plates

PLATE 10. *Chara hirsuta* Allen. Plant nat. size.

PLATE 11. *Chara hirsuta* Allen. Figs. 1, 2 \times 25; 3 \times 200; 4, 5 \times 50.

PLATE 12. *Chara Hornemannii Nordhoffiae* Allen. Plant $\frac{1}{2}$ nat. size.

PLATE 13. *Chara Hornemannii Nordhoffiae* Allen. Figs. 1, 3, 6 \times 25; 2, 4, 5 \times 12 $\frac{1}{2}$.

PLATE 14. *Chara gymnopus Sanctae-Margaritae* Allen. Plant nat. size.

PLATE 15. *Chara gymnopus Sanctae-Margaritae* Allen. Figs. 1, 4 \times 50; 2, 3, 4 \times 25.